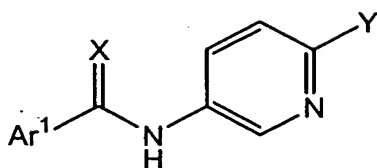


WHAT IS CLAIMED IS:

1. A compound having the formula:



wherein,

$\text{Ar}^1$  is a member selected from the group consisting of aryl, substituted aryl, heteroaryl and substituted heteroaryl;

X is a member selected from the group consisting of O, S and  $\text{N-R}^1$ ,

wherein,  $\text{R}^1$  is a member selected from the group consisting of H,  $(\text{C}_1\text{-C}_8)\text{alkyl}$ , substituted  $(\text{C}_1\text{-C}_8)\text{alkyl}$ , heteroalkyl, substituted heteroalkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, aryl $(\text{C}_1\text{-C}_4)\text{alkyl}$ , substituted aryl $(\text{C}_1\text{-C}_4)\text{alkyl}$ , CN,  $-\text{C}(\text{O})\text{R}^2$ ,  $-\text{OR}^3$ ,  $-\text{C}(\text{O})\text{NR}^3\text{R}^4$ , and  $-\text{S}(\text{O})_2\text{NR}^3\text{R}^4$ ;

wherein,  $\text{R}^2$  is a member selected from the group consisting of

$(\text{C}_1\text{-C}_8)\text{alkyl}$ , substituted  $(\text{C}_1\text{-C}_8)\text{alkyl}$ , cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocyclyl, substituted heterocyclyl, alkaryl, substituted aryl, heteroaryl, substituted heteroaryl, aryl $(\text{C}_1\text{-C}_4)\text{alkyl}$  and substituted aryl $(\text{C}_1\text{-C}_4)\text{alkyl}$ ;

$\text{R}^3$  and  $\text{R}^4$  are each members independently selected from the group consisting of hydrogen,  $(\text{C}_1\text{-C}_8)\text{alkyl}$ , substituted  $(\text{C}_1\text{-C}_8)\text{alkyl}$ , cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, aryl $(\text{C}_1\text{-C}_4)\text{alkyl}$  and substituted aryl $(\text{C}_1\text{-C}_4)\text{alkyl}$ , or  $\text{R}^3$  and  $\text{R}^4$  can be combined with the nitrogen to which each is attached to form a 5-, 6- or 7-membered ring optionally having additional heteroatoms at the ring vertices; and

Y is a member selected from the group consisting of halogen,  $\text{C}_1\text{-C}_4$  alkyl,  $\text{C}_1\text{-C}_4$  substituted alkyl,  $-\text{OCH}_3$  and  $-\text{OCF}_3$ .

1                    2.     The compound according to claim 1, wherein Ar<sup>1</sup> is a member  
2     selected from the group consisting of phenyl, substituted phenyl, indolyl, substituted  
3     indolyl, benzofuranyl, substituted benzofuranyl, furanyl, substituted furanyl, thienyl,  
4     substituted thienyl, isothiazolyl, substituted isothiazolyl, pyrazolyl and substituted  
5     pyrazolyl.

1                    3.     The compound according to claim 2, wherein Ar<sup>1</sup> is a member  
2     selected from the group consisting of substituted phenyl, substituted or unsubstituted 2-  
3     indolyl and substituted or unsubstituted 2-thienyl.

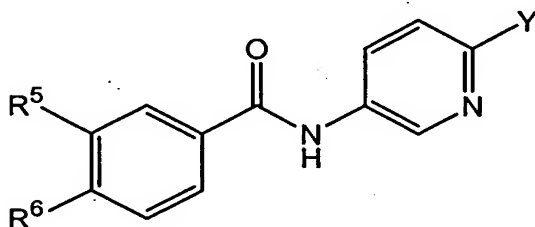
1                    4.     The compound according to claim 3, wherein X is O.

1                    5.     The compound according to claim 3, wherein the Ar<sup>1</sup> substituents  
2     are selected from the group consisting of halogen, alkyl, halo(C<sub>1</sub>-C<sub>4</sub>)alkyl, (C<sub>1</sub>-C<sub>4</sub>)alkoxy,  
3     halo(C<sub>1</sub>-C<sub>4</sub>)alkoxy, nitro, cyano, -NR<sup>7</sup>C(O)R<sup>8</sup>, -NR<sup>7</sup>R<sup>8</sup>, phenyl and substituted phenyl,  
4     wherein

5                    R<sup>7</sup> and R<sup>8</sup> are members independently selected from hydrogen,  
6                    (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted (C<sub>1</sub>-C<sub>8</sub>)alkyl, cycloalkyl, substituted  
7                    cycloalkyl, heteroalkyl, substituted heteroalkyl, heterocyclyl,  
8                    substituted heterocyclyl, aryl, substituted aryl, heteroaryl,  
9                    substituted heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl and substituted  
10                    aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, or R<sup>7</sup> and R<sup>8</sup> taken together with the nitrogen to  
11                    which each is attached form a 5-, 6- or 7-membered ring optionally  
12                    having additional heteroatoms at the ring vertices.

1                    6.     The compound according to claim 2, wherein Ar<sup>1</sup> is substituted  
2     phenyl.

1                    7.     The compound according to claim 6, having the formula:

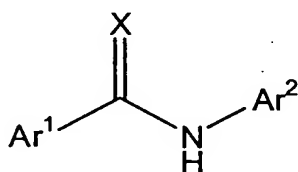


2  
3     wherein,

4                   R<sup>5</sup> and R<sup>6</sup> are members independently selected from the group consisting  
5 of H, halogen, substituted or unsubstituted alkyl, halo(C<sub>1</sub>-C<sub>4</sub>)alkyl, nitro, cyano and  
6 substituted or unsubstituted phenyl, with the proviso that both R<sup>5</sup> and R<sup>6</sup> are not H.

1                   8.       The compound according to claim 7, wherein R<sup>5</sup> and R<sup>6</sup> are  
2 members independently selected from the group consisting of H, F, and Cl, with the  
3 proviso that both R<sup>5</sup> and R<sup>6</sup> are not H.

1                   9.       A method of increasing ion flow through voltage-dependent  
2 potassium channels in a cell, said method comprising contacting said cell with a  
3 potassium channel-opening amount of a compound of the formula:



4  
5       wherein

6                   Ar<sup>1</sup> and Ar<sup>2</sup> are each members independently selected from the group  
7 consisting of aryl, substituted aryl, heteroaryl and substituted  
8 heteroaryl; and

9                   X is a member selected from the group consisting of O, S and N-R<sup>1</sup>,

10                  wherein R<sup>1</sup> is a member selected from the group consisting of H,  
11 (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted (C<sub>1</sub>-C<sub>8</sub>)alkyl, aryl, substituted aryl,  
12 heteroaryl, substituted heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, substituted  
13 aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, CN, -C(O)R<sup>2</sup>, -OR<sup>3</sup>, -C(O)NR<sup>3</sup>R<sup>4</sup>, and  
14 -S(O)<sub>2</sub>NR<sup>3</sup>R<sup>4</sup>;

15                  wherein R<sup>2</sup> is a member selected from the group consisting of

16 (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted (C<sub>1</sub>-C<sub>8</sub>)alkyl, aryl, substituted aryl,  
17 heteroaryl, substituted heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl and  
18 substituted aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl; and

19                  R<sup>3</sup> and R<sup>4</sup> are each members independently selected from the group  
20 consisting of hydrogen, (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted  
21 (C<sub>1</sub>-C<sub>8</sub>)alkyl, aryl, substituted aryl, heteroaryl, substituted  
22 heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl and substituted  
23 aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, or R<sup>3</sup> and R<sup>4</sup> can be combined with the  
24 nitrogen to which each is attached to form a 5-, 6- or

25 7-membered ring optionally having additional heteroatoms  
26 at the ring vertices.

1 10. The method according to claim 9, wherein said voltage-dependent  
2 potassium channel is responsible for the M-current.

1 11. The method according to claim 9, wherein said voltage-dependent  
2 potassium channel comprises KCNQ subunits.

1 12. The method according to claim 9, wherein Ar<sup>1</sup> is a member  
2 selected from the group consisting of phenyl, substituted phenyl, indolyl, substituted  
3 indolyl, benzofuranyl, substituted benzofuranyl, furanyl, substituted furanyl, thienyl,  
4 substituted thienyl, isothiazolyl, substituted isothiazolyl, pyrazolyl and substituted  
5 pyrazolyl.

1 13. The method according to claim 9, wherein Ar<sup>1</sup> is substituted  
2 phenyl, substituted or unsubstituted 2-indolyl and substituted or unsubstituted 2-thienyl.

1 14. The method according to claim 9, wherein X is O.

1 15. The method according to claim 13, wherein the Ar<sup>1</sup> substituents are  
2 selected from the group consisting of halogen, alkyl, halo(C<sub>1</sub>-C<sub>4</sub>)alkyl, (C<sub>1</sub>-C<sub>4</sub>)alkoxy,  
3 halo(C<sub>1</sub>-C<sub>4</sub>)alkoxy, nitro, cyano, -NHC(O)R<sup>7</sup>, -NHR<sup>7</sup>, phenyl and substituted phenyl,  
4 wherein  
5 R<sup>7</sup> is a member selected from hydrogen, (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted  
6 (C<sub>1</sub>-C<sub>8</sub>)alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl,  
7 heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, heteroaryl, substituted  
8 heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl and substituted aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, or R<sup>7</sup> can be combined with  
9 the nitrogen to which it is attached to form a 5-, 6- or 7-membered ring optionally having  
10 additional heteroatoms at the ring vertices.

1 16. The method according to claim 9, wherein Ar<sup>2</sup> is selected from the  
2 group consisting of heteroaryl and substituted heteroaryl.

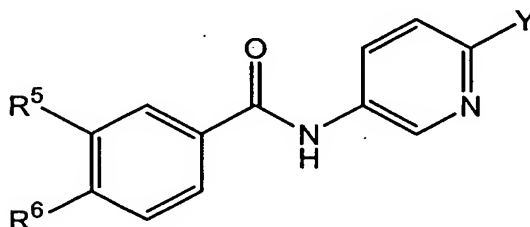
1 17. The method according to claim 9, wherein Ar<sup>1</sup> is substituted aryl;  
2 Ar<sup>2</sup> is heteroaryl or substituted heteroaryl; and X is O.

1                    18.    The method according to claim 15, wherein Ar<sup>2</sup> is pyridyl or  
2    substituted pyridyl.

1                    19.    The method according to claim 18, wherein Ar<sup>2</sup> is selected from  
2    the group consisting of 6-methyl-3-pyridyl and 2-chloro-5-pyridyl.

1                    20.    The method according to claim 18; wherein Ar<sup>1</sup> is substituted  
2    phenyl.

1                    21.    The method according to claim 20, said compound having the  
2    formula:

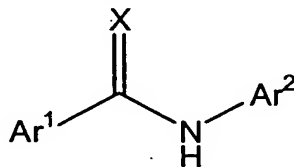


3  
4                    wherein,

5                    R<sup>5</sup> and R<sup>6</sup> are members independently selected from the group consisting  
6    of H, halogen, alkyl, halo(C<sub>1</sub>-C<sub>4</sub>)alkyl, nitro, cyano and phenyl, with the proviso that both  
7    R<sup>5</sup> and R<sup>6</sup> are not H.

1                    22.    The method according to claim 21, wherein R<sup>5</sup> and R<sup>6</sup> are members  
2    independently selected from the group consisting of H, F, and Cl, with the proviso that  
3    both R<sup>5</sup> and R<sup>6</sup> are not H.

1                    23.    A method of treating a central or peripheral nervous system  
2    disorder or condition through modulation of a voltage-dependent potassium channel, said  
3    method comprising administering to a subject in need of such treatment, an effective  
4    amount of a compound having the formula:



5  
6                    wherein

Ar<sup>1</sup> and Ar<sup>2</sup> are each members independently selected from the group consisting of aryl, substituted aryl, heteroaryl and substituted heteroaryl; and

X is a member selected from the group consisting of O, S and N-R<sup>1</sup>, wherein R<sup>1</sup> is a member selected from the group consisting of H, (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted (C<sub>1</sub>-C<sub>8</sub>)alkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, substituted aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, CN, -C(O)R<sup>2</sup>, -OR<sup>3</sup>, -C(O)NR<sup>3</sup>R<sup>4</sup>, and -S(O)<sub>2</sub>NR<sup>3</sup>R<sup>4</sup>;

wherein R<sup>2</sup> is a member selected from the group consisting of (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted (C<sub>1</sub>-C<sub>8</sub>)alkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl and substituted aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl; and

R<sup>3</sup> and R<sup>4</sup> are each members independently selected from the group consisting of hydrogen, (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted (C<sub>1</sub>-C<sub>8</sub>)alkyl, aryl, substituted aryl, heteroaryl, substituted heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl and substituted aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, or R<sup>3</sup> and R<sup>4</sup> can be combined with the nitrogen to which each is attached to form a 5-, 6- or 7-membered ring optionally having additional heteroatoms at the ring vertices.

24. The method according to claim 23, wherein said disorder or condition is selected from the group consisting of migraine, ataxia, Parkinson's disease, bipolar disorders, spasticity, mood disorders, brain tumors, psychotic disorders, myokymia, seizures, epilepsy, hearing loss, vision loss, Alzheimer's disease, age-related memory loss, learning deficiencies, motor neuron diseases, and stroke.

25. The method according to claim 24, wherein said disorder or condition is hearing loss.

26. The method according to claim 24, wherein said disorder or condition is epilepsy or seizures.

1                   27.     The method according to claim 23, wherein Ar<sup>1</sup> is a member  
2     selected from the group consisting of phenyl, substituted phenyl, indolyl, substituted  
3     indolyl, benzofuranyl, substituted benzofuranyl, furanyl, substituted furanyl, thienyl,  
4     substituted thienyl, isothiazolyl, substituted isothiazolyl, pyrazolyl and substituted  
5     pyrazolyl.

1                   28.     The method according to claim 27, wherein Ar<sup>1</sup> is substituted aryl,  
2     substituted or unsubstituted 2-indolyl and substituted or unsubstituted 2-thienyl.

1                   29.     The method according to claim 28, wherein X is O.

1                   30.     The method according to claim 28, wherein the Ar<sup>1</sup> substituents are  
2     selected from the group consisting of halogen, alkyl, halo(C<sub>1</sub>-C<sub>4</sub>)alkyl, (C<sub>1</sub>-C<sub>4</sub>)alkoxy,  
3     halo(C<sub>1</sub>-C<sub>4</sub>)alkoxy, nitro, cyano, -NHC(O)R<sup>7</sup>, -NHR<sup>7</sup>, phenyl and substituted phenyl,  
4     wherein  
5                   R<sup>7</sup> is a member selected from hydrogen, (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted  
6     (C<sub>1</sub>-C<sub>8</sub>)alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl,  
7     heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, heteroaryl, substituted  
8     heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl and substituted aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl; or R<sup>7</sup> can be combined with  
9     the nitrogen to which it is attached to form a 5-, 6- or 7-membered ring optionally having  
10    additional heteroatoms at the ring vertices.

1                   31.     The method according to claim 23, wherein Ar<sup>2</sup> is selected from  
2     the group consisting of heteroaryl and substituted heteroaryl.

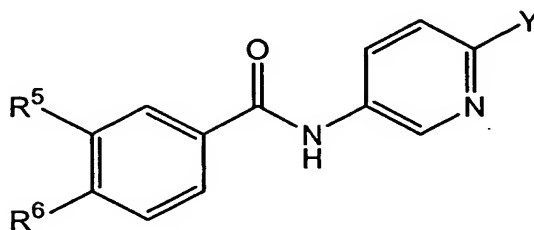
1                   32.     The method according to claim 23, wherein Ar<sup>1</sup> is substituted aryl;  
2     Ar<sup>2</sup> is heteroaryl or substituted heteroaryl; and X is O.

1                   33.     The method according to claim 31, wherein Ar<sup>2</sup> is pyridyl or  
2     substituted pyridyl.

1                   34.     The method according to claim 33, wherein Ar<sup>2</sup> is selected from  
2     the group consisting of 6-methyl-3-pyridyl and 2-chloro-5-pyridyl.

1                   35.     The method according to claim 34, wherein Ar<sup>1</sup> is substituted  
2     phenyl.

1                    36.    The method according to claim 35, said compound having the  
2    formula:

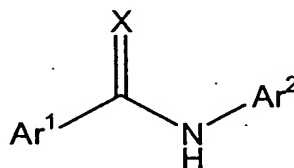


3  
4            wherein,

5                    R<sup>5</sup> and R<sup>6</sup> are members independently selected from the group consisting  
6    of H, halogen, alkyl, halo(C<sub>1</sub>-C<sub>4</sub>)alkyl, nitro, cyano and phenyl, with the proviso that both  
7    R<sup>5</sup> and R<sup>6</sup> are not H.

1                    37.    The method according to claim 36, wherein R<sup>5</sup> and R<sup>6</sup> are members  
2    independently selected from the group consisting of H, F, and Cl, with the proviso that  
3    both R<sup>5</sup> and R<sup>6</sup> are not H.

1                    38.    A composition comprising a pharmaceutically acceptable excipient  
2    and a compound of the formula:



3  
4            wherein,

5                    Ar<sup>1</sup> and Ar<sup>2</sup> are each members independently selected from the group  
6                    consisting of aryl, substituted aryl, heteroaryl and substituted  
7                    heteroaryl; and

8                    X is a member selected from the group consisting of O, S and N-R<sup>1</sup>,  
9                    wherein R<sup>1</sup> is a member selected from the group consisting of H,

10                    (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted (C<sub>1</sub>-C<sub>8</sub>)alkyl, aryl, substituted aryl,  
11                    heteroaryl, substituted heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, substituted  
12                    aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, CN, -C(O)R<sup>2</sup>, -OR<sup>3</sup>, -C(O)NR<sup>3</sup>R<sup>4</sup>, and  
13                    -S(O)<sub>2</sub>NR<sup>3</sup>R<sup>4</sup>;

14                    wherein R<sup>2</sup> is a member selected from the group consisting of

15                    (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted (C<sub>1</sub>-C<sub>8</sub>)alkyl, aryl, substituted aryl,



16 heteroaryl, substituted heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl and  
17 substituted aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl; and  
18 R<sup>3</sup> and R<sup>4</sup> are each members independently selected from the group  
19 consisting of hydrogen, (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted  
20 (C<sub>1</sub>-C<sub>8</sub>)alkyl, aryl, substituted aryl, heteroaryl, substituted  
21 heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl and substituted  
22 aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, or R<sup>3</sup> and R<sup>4</sup> can be combined with the  
23 nitrogen to which each is attached to form a 5-, 6- or 7-  
24 membered ring optionally having additional heteroatoms at  
25 the ring vertices.

1 39. The composition according to claim 38, wherein Ar<sup>1</sup> is substituted  
2 aryl, substituted or unsubstituted 2-indolyl and substituted or unsubstituted 2-thienyl.

1 40. The composition according to claim 38, wherein X is O.

1 41. The composition according to claim 40, wherein the Ar<sup>1</sup>  
2 substituents are selected from the group consisting of halogen, alkyl, halo(C<sub>1</sub>-C<sub>4</sub>)alkyl,  
3 (C<sub>1</sub>-C<sub>4</sub>)alkoxy, halo(C<sub>1</sub>-C<sub>4</sub>)alkoxy, nitro, cyano, -NHC(O)R<sup>7</sup>, -NHR<sup>7</sup>, phenyl and  
4 substituted phenyl, wherein

5 R<sup>7</sup> is a member selected from hydrogen, (C<sub>1</sub>-C<sub>8</sub>)alkyl, substituted  
6 (C<sub>1</sub>-C<sub>8</sub>)alkyl, cycloalkyl, substituted cycloalkyl, heteroalkyl, substituted heteroalkyl,  
7 heterocyclyl, substituted heterocyclyl, aryl, substituted aryl, heteroaryl, substituted  
8 heteroaryl, aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl and substituted aryl(C<sub>1</sub>-C<sub>4</sub>)alkyl, or R<sup>7</sup> can be combined with  
9 the nitrogen to which it is attached to form a 5-, 6- or 7-membered ring optionally having  
10 additional heteroatoms at the ring vertices.

1 42. The composition according to 38, wherein Ar<sup>2</sup> is selected from the  
2 group consisting of heteroaryl and substituted heteroaryl.

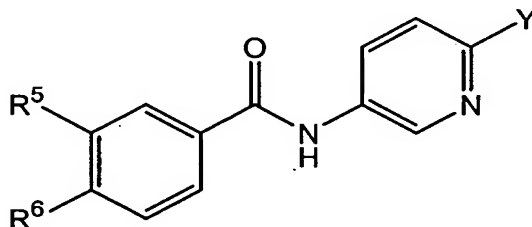
1 43. The composition according to claim 38; wherein Ar<sup>1</sup> is substituted  
2 aryl; Ar<sup>2</sup> is heteroaryl or substituted heteroaryl; and X is O.

1 44. The composition according to claim 42, wherein Ar<sup>2</sup> is pyridyl or  
2 substituted pyridyl.

1                    45.    The composition according to claim 44, wherein Ar<sup>2</sup> is selected  
2    from the group consisting of 6-methyl-3-pyridyl and 2-chloro-5-pyridyl.

1                    46.    The composition according to claim 44, wherein Ar<sup>1</sup> is substituted  
2    phenyl.

1                    47.    The composition according to claim 46, said compound having the  
2    formula:



3  
4                    wherein,

5                    R<sup>5</sup> and R<sup>6</sup> are members independently selected from the group consisting  
6    of H, halogen, alkyl, halo(C<sub>1</sub>-C<sub>4</sub>)alkyl, nitro, cyano and phenyl, with the proviso that both  
7    R<sup>5</sup> and R<sup>6</sup> are not H.

1                    48.    The composition according to claim 47, wherein R<sup>5</sup> and R<sup>6</sup> are  
2    members independently selected from the group consisting of H, F, and Cl, with the  
3    proviso that both R<sup>5</sup> and R<sup>6</sup> are not H.